MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2017/2018

DCS5038 – PROGRAM DESIGN

(DIT & DBIS Groups)

14 OCTOBER 2017
2.30 p.m. – 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENT:

1. This question paper consists of 8 pages with 5 questions.
2. **SECTION A**: Answer **ALL** questions.
3. **SECTION B**: Answer **ONLY ONE (1)** question.
4. Please print all your answers in the Answer Booklet provided.

SECTION A (75 Marks)

Instruction: *Answer ALL questions from this section and write your answers in the answer booklet provided.*

QUESTION 1 (25 Marks)

a. Based on the description given below, draw the **flowchart** to calculate mileage reimbursement for a salesperson. [13 marks]

- Initialize all the required variables.
- Get the inputs *beginning odometer reading* and *ending odometer reading* from the user.
- Calculate the *travelling mileage* based on the formula given.
  travelling mileage = ending odometer – beginning odometer
- If travelling mileage less than 100, calculate the total amount of reimbursement based on the table given. If travelling mileage is more or equal to 100, prompt user to stay overnight or not. Calculate the amount of reimbursement accordingly.

Travelling Mileage	Overnight	Rate (RM)
<100		0.45
>=100	Y	0.95
	N	0.65

- Display the *travelling mileage* and *reimbursement.*
- Repeat the process by asking user to continue or to terminate the program. Use *do while* loop.

b. Based on the description given in (a), write the **pseudocode.** [12 marks]

[Total 25 Marks]

QUESTION 2 (25 Marks)

a. Convert the following mathematical formulas to the proper C expressions. Use appropriate built-in functions from the *math.h* header file. [4 marks]

i. $M = \sqrt{U + V}W^2$

ii. $M = \frac{\sqrt{B^2 - 4AC}}{2A}$

Continued...

b. Write the *nested if-else* statement that determines the *status* of Chronical Kidney Disease depending on *Glomerular Filtration Rate (GFR)* and *division range* of a patient as indicated in the table below.

[9 marks]

Chronical Kidney Disease		
GFR	**Division Range**	**Status**
>=90	-	Normal
60-89	60-69	Mild
	70-79	Severe Mild
	80-89	Moderate Pain
30-59	30-40	Severe Pain
	41-59	Worst Pain
<30	-	Kidney Failure

c. Write a full program that determines the *status* of a compresses gas cylinder based on cylinder color code. The program should respond to the input of a letter.

[12 marks]

In function *main()*

- Display a message of cylinder color code as shown in the sample output.
- Get the *code* from user.
- Call function *cylinder()* and pass the *code* as the parameter.
- Display the *code* and *status*.

In function *cylinder()*

- Declare function prototype for function *cylinder()*.
- Use *switch-case* statement to set the *status* based on the *code* (refer to the table below).
- Return *status* to *main()*.

Compress Gas Cylinder	
Color Code	**Status**
R	Ammonia
B	Carbon Monoxide
G	Hydrogen
W	Oxygen

SAMPLE OUTPUT

```
R: Red G:Grey B:Blue W:White
Enter the first letter of the cylinder's color code: B

Cylinder color code B = Carbon Monoxide
```

```
R: Red G:Grey B:Blue W:White
Enter the first letter of the cylinder's color code: P

Cylinder color code P = Invalid
```

[Total 25 Marks]

Continued...

QUESTION 3 (25 Marks)

a. Trace the output for the following program. [3 marks]

```
#include<stdio.h>
int main()
{
     int a=3, b=7, c[7],i=3;

     printf("c=%d",*c=a+b);
     printf("\nc=%d",*(c+1)=c[0]+5);
     printf("\nc=%d",*(c+2)=b+c[1]);

     while(i<6)
     {
          printf("\nc=%d",*(c+i)=i+5);
          i++;
     }

}
```

b. Information in Table 1.0 is an example of patient record for Mia Clinic. Write a full program based on the following instructions given. [12 marks]

Patient Name	Patient ID	Diagnosis	Drug Name
Alvin Lim Fang Chuen	11122	Fever	Panadol 5 mg
Logeswaran Ilanggovan	11111	Flue	Amoxicillin 250 mg
Izah Nursabrina	23356	Acute Upper	Chlorpheniramine Maleate 4 mg
Mohamad Edrus Iskandar	66324	Hemorrhoids	Diosmin 450 mg
Avineshwaran	33254	Eczema	Loratadine 10 mg
Yeong Fu Seng	22245	Gaseon	Doxycycline 100 mg

Table 1.0 : Mia Clinic record

Declare a structure of Mia Clinic record called *MiaClinic* that has:

- Patient Name : *name (string)*
- Patient ID : *patientID(integer)*
- Diagnosis : *diagnosis(string)*
- Drug name : *drug name(string)*

In function *main()*

- Create a structure variable array called *PatientR* with 6 elements.
- Using *for loop*, ask user to enter *name, patientID, diagnosis* and *drug name*.
- Using another *for loop*, display the *name, patientID, diagnosis* and *drug name*.

Continued...

c. Write a full program that calculates the total price based on the instructions given below. [10 marks]

In function main():

- Create files variables named *fstationery* and *fwstationery*.
- Open the *stationery.txt* file for reading using *fstationery.txt* and *fwstationery* for append the file.
- Using *while loop* statement to loop till the end of the file:
  - Read all the data from the file and store them in appropriate variables.
  - Display all the data in the command prompt.
  - Calculate the *total price* and append the *total price* into the file.
  - Close the file. The content of the file and the output screen are shown below.

Content of *stationery.txt*

```
Pencil 3.00 5
```

Content of *stationery.txt* after execution

```
Pencil 3.00 5 15.00
```

SAMPLE OUTPUT

```
Stationery Name: Pencil
Price: RM 3.00
Quantity: 5
Total: RM 15.00
```

[Total 25 Marks]

Continued...

SECTION B (25 Marks)

Instruction: *Choose and answer* ***ONLY ONE (1)*** *question from this section and write your answers in the answer booklet provided.*

QUESTION 1 (25 Marks)

Write a full program based on the following instructions. This program prompts the user to enter company details and determine their purchasing records based on the type of tent and the quantity.

Declare a *structure* of Tent record called *TentR* that has:

- Company Name : *compname (string)*
- Tent Name : *tentname (string)*
- Quantity : *qtty (int)*
- Price : *price (float)*
- Total Price : *totalprice(float)*
- Discount Price : *discPrice(float)*
- Total Payment : *totalpay(float)*

In function main() :

- Create a structure variable array *T* which has 3 elements.
- Using a *for loop* :
  - Prompt the user to enter *compname, tentname* and *qtty.*
- Call function *calTotalPrice(...)* and pass *T* as parameter to determine the total price.
- Call function *calTotalPay(...)* and pass *T* as parameter to determine the total payment after discount.
- Using a *for loop* :
  - Display all the details of the three companies' purchasing records as shown in the sample output.

In function *calTotalPrice(...)*:

- Declare a prototype for this function.
- Using a *for loop* :
  - Using *if else* statement, assign the *price* based on the following table. [Hint: Use string compare function]

Tent Name	Price (RM)
Arabic	300
Normal	200
Fancy	500
Other	0

  - Calculate the *totalprice* based on the formula given below:
    Total Price = Price x Quantity

Continued...

In function *calTotalPay(...)*:

- Declare a prototype for this function.
- Using a *for loop*:
  - Using *if else* statement, calculate the *discPrice* based on the following table.

Quantity	Discount %
3-4	20
5	30
6 and above	40
0 and below	0

  - Calculate the *totalpay* based on the formula given below:
    Total Payment = Total Price – Discount Price

SAMPLE OUTPUT

```
Enter Company name: Amani
Enter Tent name: Arabic
Enter Quantity Tent: 2

Enter Company name: Growala
Enter Tent name: Fancy
Enter Quantity Tent: 5

Enter Company name: Aleesya
Enter Tent name: Normal
Enter Quantity Tent: 7

CompanyName  TypeTent Qtty  Price  TotalPrice  DiscPrice  TotalPayment
Amani         Arabic    2  300.00      600.00       0.00        600.00
Growala       Fancy     5  500.00     2500.00     750.00       1750.00
Aleesya       Normal    7  200.00     1400.00     560.00        840.00
```

[Total 25 Marks]

Continued...

QUESTION 2 (25 Marks)

Write a full program that determine the total price for clothes.

Given is a text file named *inputR.txt* that contains data of brand name, clothes type and price.

Content of *inputR.txt*
<brandname><clothestype><price>

```
POLO        SHIRT    43.20
PONNEY      PANTS    53.60
KIKI        SKIRT    63.50
```

Another text file named *outputR.txt* is empty file.

In function *main()* :

- Declare all necessary variables to store the *brandname*, *clothestype*, *price*, *discount* and *total* price after discount.
- Create files name: *finput* and *foutput*.
- Open the file *inputR.txt* for reading.
- Open the *outputR.txt* for writing.
- If the file *inputR.txt* doesn't exist, display "*The file cannot be opened!*", else use a *while loop* to read each record until the end of the file:
  - Read the *brandname, clothestype* and *price* from the file.
  - Call function *Calculatediscount(...)* by passing the *brandname* and *price* as parameters.
  - Calculate *total* based on the following formula:

    total=price-discount
  - Write the *brandname, clothestype, price, discount* and *total* into file *outputR.txt* as shown below.

Content of *outputR.txt* after execution
<brandname><clothestype><price><discount><total>

```
POLO        SHIRT    43.20  17.20 26.00
PONNEY      PANTS    53.60  15.90 37.70
KIKI        SKIRT    63.50  12.60 50.90
```

- Display all the records in the command prompt as shown in the sample output given.

SAMPLE OUTPUT

```
Brand Name Clothes Type Price  Discount  Total
POLO            SHIRT   43.20   17.20    26.00
PONNEY          PANTS   53.60   15.90    37.70
KIKI            SKIRT   63.50   12.60    50.90
```

- Close file *inputR.txt* and *outputR.txt*.

Continued...

In function *Calculatediscount(...)*:

- Declare a prototype for this function.
- Determine the *discount* based on the following table.

discount = Discount rate x price

Brand name	**Discount Rate**
POLO	40%
PONNEY	30%
KIKI	20%

- Return the *discount* value.

[Total 25 Marks]

End of Page.